

Sanctuary Ecologically Significant Area (SESA)

SESA 15: La Cruz Canyon

Description

SESA 15 contains a mixture of hard (18%) and soft bottom in and around the head of La Cruz Canyon. The southern part of the SESA is adjacent to Piedras Blancas State Marine Conservation Area (SMCA). With a depth range (71-422 m) that spans the shelf, shelf break and slope 1 depth zones, this SESA has relatively high habitat richness (10 habitats) and diversity (index = 5.31).

Groundfish survey trawls in shelf and shelf break habitat have captured a couple coral species and a fish fauna of intermediate richness and diversity. Surveys to characterize benthic habitats and communities (using camera sled and ROVs) have occurred at multiple locations in shelf and shelf break habitats. The upwelling zone at Pt. Piedras Blancas overlaps the eastern part of the SESA; upwelled water may be advected through the SESA. Lower levels of primary productivity are observed. This SESA is on the eastern edge of a krill hotspot. Some seabird and mammal surveys in this area. This SESA is located within MBNMS, and research activities may require a permit

(http://montereybay.noaa.gov/resourcepro/permit/permits_need.html).

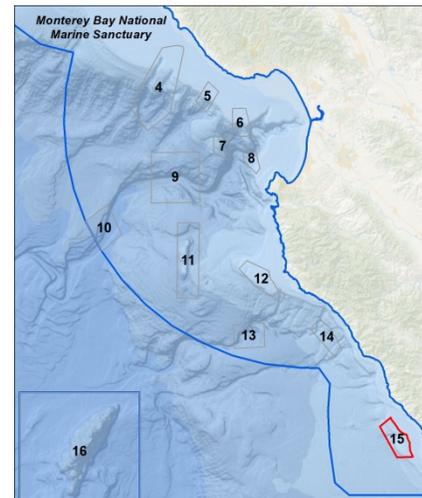


Figure 1. The location of SESA 15 and twelve additional SESAs in Monterey Bay National Marine Sanctuary. Credit: Chad King/MBNMS.

Resource Management Issues

SESA 15 encompasses large portions of Rockfish Conservation Area zones and also contains proposed demersal fishes (EFH) conservation area.

- Adjacent to State MPA: Piedras Blancas SMCA
- Commercial bottom trawl
- Adjacent to commercial benthic fixed gear
- Rockfish Conservation Area (trawl)
- Adjacent to Essential Fish Habitat (EFH) Conservation Area
- EFH bottom trawl closure proposed (2013)
- Recreational fishing
- Leatherback sea turtle critical habitat

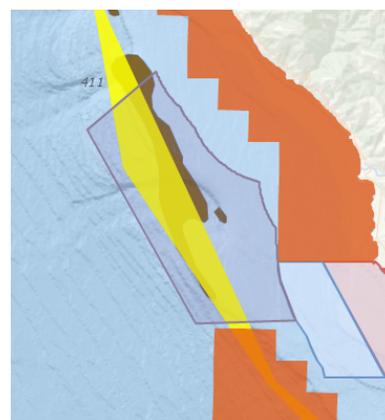


Figure 2. Close-up map of SESA 15. Grey border=SESA boundary; yellow=Rockfish Conservation Area; light orange border=EFH Conservation Area; light blue boundary=State MPA; orange=commercial benthic fixed gear dominant use. Source: SESAs Interactive Map, <http://sanctuarymonitoring.org/maps/sesa/>.

Living Marine Resources & Uses

Table 1. Species known to occur within SESA 15: La Cruz Canyon.

Invertebrates	<ul style="list-style-type: none"> -sponges† (Porifera), e.g., orange, white sponges -hydroids (Hydrozoa) -stony corals† (Scleractinia), e.g., bean coral (Caryophyllidae) -soft corals† (Alcyonacea), e.g. gorgonians -sea slugs (Gastropoda), e.g., <i>Pleurobranchaea californica</i> -octopi (Cephalopoda) -rock crabs (Decapoda) -bryozoan (Gymnolaemata†) -feather stars (Crinoidea) -sea stars (Asteroidea), e.g., <i>Mediaster</i> spp., sunflower star (<i>Pycnopodia</i> sp. or <i>Rathbunaster</i> sp.), sand stars -brittle stars (Ophiuroidea) <p>(CSUMB/MBNMS videos, stills; NMFS West Coast Bottom Trawl Groundfish Survey)</p> <p><i>Found nearby:</i></p> <ul style="list-style-type: none"> -sea pens† (Pennatulacea), e.g., Virgulariidae <p>(NMFS West Coast Bottom Trawl Groundfish Survey)</p>
Fishes	<ul style="list-style-type: none"> -Spotted Ratfish (<i>Hydrolagus colliei</i>) -rockfishes (<i>Sebastes</i> spp.), e.g., Greenstriped, Yelloweye³, Darkblotched³, Boccacio³, Canary³, Cowcod², Vermilion, Rosy -Longspine Thornyhead (<i>Sebastolobus altivelis</i>) -Sablefish (<i>Anoplopoma fimbria</i>) -Kelp Greenling (<i>Hexagrammos decagrammus</i>) -Lingcod (<i>Ophiodon elongatus</i>) -Petrale Sole³ (<i>Eopsetta jordani</i>) <p>(CSUMB/MBNMS videos, stills; MBNMS 2013)</p>
Marine birds	<ul style="list-style-type: none"> -Sooty Shearwater (<i>Puffinus griseus</i>) -California Brown Pelican (<i>Pelecanus occidentalis californicus</i>), -California Gull (<i>Larus californicus</i>), -Black-legged Kittiwake (<i>Rissa tridactyla</i>), -Common Murre (<i>Uria aalge</i>) -Rhinoceros Auklet (<i>Cerorhinea monocerata</i>) -Cassin's Auklet² (<i>Ptychoramphus aleuticus</i>) <p>(Ainley et al. 2012)</p>
Marine mammals	<ul style="list-style-type: none"> -gray whale (<i>Eschrichtius robustus</i>) -dolphins (Odontoceti), e.g., Risso's dolphin (<i>Grampus griseus</i>), Pacific white-sided dolphin (<i>Lagenorhynchus obliquidens</i>), Dall's porpoise (<i>Phocoenoides dalli</i>) -California sea lion (<i>Zalophus californianus</i>) <p>(NOAA, 2003)</p>
Marine reptiles	<ul style="list-style-type: none"> -leatherback sea turtle¹ (<i>Dermodochelys coriacea</i>) (NOAA, 2003)

Special Status Species: Endangered¹, Birds of Conservation Concern², Overfished³, Biogenic habitat†

Diverse or productive communities:

- low primary productivity
- moderate krill production
- marine bird high diversity

Migration, breeding, or foraging areas:

- 100% in leatherback sea turtle NMFS critical habitat
- 25% in Sooty Shearwater (IBA, Important Bird Area)

Research

SIMoN projects:

CSCAPE: Collaborative Survey of Cetacean Abundance and the Pelagic Ecosystem_ (2005-07)

<http://sanctuarysimon.org/projects/100273/cscape%3a--collaborative-survey-of-cetacean-abundance-and-the-pelagic-ecosystem>.

Deepwater Characterization and Baseline Monitoring in the Monterey Bay National Marine Sanctuary (2009-current)

<http://sanctuarymonitoring.org/projects/100373/deepwater-characterization-and-baseline-monitoring-in-the-monterey-bay-national-marine-sanctuary>

Marine Protected Area Monitoring and Shelf Characterization in Monterey Bay National Marine Sanctuary (2007-09)

<http://sanctuarysimon.org/projects/100320/marine-protected-area-monitoring-and-shelf-characterization-in-monterey-bay-national-marine-sanctuary->

Monitoring whales by Cascadia Research Collective (1991-current)

<http://sanctuarymonitoring.org/projects/100152/monitoring-whales-by-cascadia-research-collective>

Sea Turtle Restoration Project: Leatherback Watch Program (2010-current)

<http://sanctuarymonitoring.org/projects/100395/sea-turtle-restoration-project%3a-leatherback-watch-program->

Structure of Populations, Levels of Abundance and Status of Humpbacks (SPLASH) (2004-current)

<http://sanctuarymonitoring.org/projects/100224/structure-of-populations%2c-levels-of-abundance-and-status-of-humpbacks-%28splash%29>

Tagging of Pacific Predators (TOPP) (2000-current)

<http://sanctuarymonitoring.org/projects/100137/tagging-of-pacific-predators-%28topp%29>

Tracking Black-footed Albatross Movements and Conservation (2004-08)

<http://sanctuarysimon.org/projects/100305/tracking-black-footed-albatross-movements-and-conservation>

Underwater Behavior of Large Whales Using Suction-cup Attached Tags (2000-current)

<http://sanctuarymonitoring.org/projects/100153/underwater-behavior-of-large-whales-using-suction-cup-attached-tags>

usSEABED: A USGS Pacific Coast Offshore Surficial Sediment Data and Mapping Project (2005-current)

<http://sanctuarymonitoring.org/projects/100247/usseabed%3a-a-usgs-pacific-coast-offshore-surficial-sediment-data-and-mapping-project>

Monitoring stations and/or data collection instruments:

- NMFS West Coast Bottom Trawl Groundfish Survey

MBNMS research:

- CSUMB shelf characterization 2007-2011

Science Needs & Research Questions

Habitat Characterization of the Continental Shelf

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_characterization.pdf

- What are the distribution and abundance of organisms and habitats on the continental shelf?

Habitat Characterization of the Continental Slope

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_characterization_slope.pdf

- What are the distribution and abundance of organisms and habitats on the continental slope?
- How do corals and chemosynthetic communities on the continental slope provide biogenic habitat for other species?

Human Health - Harmful Algal Blooms

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_habs.pdf

- How do HABs affect local species populations?

Landslide Management

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_landslide_mgmt_bigsur.pdf

- Where have historic accumulations of slide debris dispersed to, and where might debris be transported within the marine environment in the future?

Socioeconomics and the Human Dimension

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_socioeconomics.pdf

- How do we determine the overall impact of multiple human activities (some with negative and some with positive influence) on Sanctuary resources?

Water Quality Integrated Analyses

http://sanctuaries.noaa.gov/science/assessment/pdfs/mbnms_water_quality.pdf

- Determine and implement the necessary monitoring to assess the condition of water quality in the Sanctuary.

SESAs Interactive Map: <http://sanctuarysimon.org/maps/sesa>

Publically Available Imagery

- CSUMB/MBNMS camera sled and ROV (<http://sep.csUMB.edu/ifame/scid/>)



Figure 3. Rosy Rockfish (*Sebastes rosaceus*) and sponges. Credit: IfAME/CSUMB/MBNMS (<http://sep.csUMB.edu/ifame/scid/>).



Figure 4. Crinoid (Class Crinoidea). Credit: IfAME/CSUMB/MBNMS (<http://sep.csUMB.edu/ifame/scid/>).

SESA Data Layers

Table 2. The 13 SESAs of the MBNMS are comprised of a variety of biological and environmental characteristics that describe unique pelagic and benthic deep sea communities. Listed are a subset of these qualities which include habitat diversity (Shannon-Wiener diversity index); hard substrate area coverage (%); the most common type of habitat; the presence and abundances of corals and sponges, demersal fishes, and marine birds; and the area coverage (%) of upwelling zone within each SESA. Sources: Draft MBNMS report in preparation; SESAs Interactive Map, <http://sanctuarymonitoring.org/maps/sesa/>.

SESA	Habitat diversity (H')	Hard substrate (%)	Primary habitat	Corals & sponges	Demersal fishes	Marine birds	Upwelling zone (%)
4	5.43	8%	Slope 2 soft canyon	yes-high	yes-high	yes-high	yes-50%
5	6.13	19%	Slope 1 Soft Canyon	yes- high	yes-med	yes-med	yes-100%
6	6.62	13%	Shelf Break soft	yes-high	yes-low	yes-med	no
7	3.52	9%	Slope 2 soft canyon	yes-med	yes-high	yes-med	no
8	5.32	33%	Slope 2 soft canyon	yes-med	yes-med	yes-high	no
9	2.34	5%	Slope 2 soft canyon	yes-high	yes-high	yes-low	no
10	3.23	1%	Rise soft canyon	yes-med	not sampled	yes-low	no
11	1.56	16%	Slope 2 soft	yes-med	yes-high	yes-low	no
12	4.17	32%	Shelf hard	yes-med	yes-high	yes-med	yes-50%
13	2.00	0%	Slope 2 soft	yes-low	not sampled	yes-low	no
14	2.41	0%	Slope 1 Soft	yes-med	yes-high	yes-med	yes-50%
15	5.31	18%	Shelf Break soft	yes-med	yes-med	yes-med	yes-25%
16	3.12	73%	Slope 2 hard	yes-high	yes-high	yes-low	no

Selected Publications

- Aiken E, Baruch N, Basset M, Carlson R, Cuzick M, et al., Lindholm J. 2013. Characterization of Demersal Fish Assemblages Within Seven Sanctuary Ecologically Significant Areas in the MBNMS. Poster presentation at Sanctuary Currents Symposium, Seaside, CA. Available at: <http://montereybay.noaa.gov/research/techreports/trmsci4702013.html>
- Ainley D, Spear L, Casey J, Ford RG, Gill T, et al. 2012. Chapter 3: Biogeography of Marine Birds. A Biogeographic Assessment off North/Central California. Retrieved from Center for Coastal Monitoring and Assessment (NCCOS), National Ocean Service. <http://ccma.nos.noaa.gov/ecosystems/sanctuaries/california/html/birds/>
- Benson SR, Forney KA, Harvey JT, Carretta JV, Dutton PH. 2007. Abundance, Distribution, and Habitat of Leatherback Turtles (*Dermochelys coriacea*) Off California, 1990– 2003. *Fishery Bulletin*, 105(3): 337-347. Available at: http://aquaticcommons.org/8876/1/benson_Fish_Bull_2007.pdf
<http://montereybay.noaa.gov/research/techreports/trbenson2007.html>.
- Brown JA, EJ Burton, S De Beukelaer. 2013. The Natural Resources of Monterey Bay National Marine Sanctuary: A Focus on Federal Waters. Marine Sanctuaries Conservation Series ONMS-13-05. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 264 pp. Available at: <http://montereybay.noaa.gov/research/techreports/trbrown2013.html>
- California State University of Monterey Bay (CSUMB). 2005. *Shelf Characterization and Image Display (SCID)*. World Wide Web electronic publication. [<http://sep.csUMB.edu/ifame/scid/>]. Accessed [08/01/15].
- Cecchetti AJ. 2008. A Site Characterization of the Piedras Blancas State Marine Conservation Area Using a Towed Camera Sled. A Capstone Project, California State University, Monterey Bay. MBNMS Technical Report, 25 pp. Available at: http://sanctuariesimon.org/regional_docs/monitoring_projects/100373_Cecchetti_2008.pdf
<http://montereybay.noaa.gov/research/techreports/trcecch2008.html>
- Huggins JG. 2009. Identification, Counts, and Behavior of Demersal Fishes along the Central Coast of California Using a Towed Camera Sled. A Capstone Project, California State University, Monterey Bay. MBNMS Technical Report, 22 pp. Available at: http://sanctuariesimon.org/regional_docs/monitoring_projects/100373_Huggins_2009.pdf
<http://montereybay.noaa.gov/research/techreports/trhuggins2009.html>.
- Institute for Applied Marine Ecology and Monterey Bay National Marine Sanctuary. 2011. Characterizing the Deep: Surveys in the Monterey Bay National Marine Sanctuary 2007-2010. 14pp. Available at: <http://montereybay.noaa.gov/research/techreports/trifame2011.html>
- Kelly M. 2010. Distribution of the Blackeye Goby, *Rhinogobiops nicholsi*, Around Temperate Reefs Along the Central Coast of California. A Capstone Project, California State University, Monterey Bay. MBNMS Technical Report, 28 pp. Available at: http://sanctuariesimon.org/regional_docs/monitoring_projects/100373_Kelly_2010.pdf
<http://montereybay.noaa.gov/research/techreports/trkelly2010.html>.
- Knight A. 2011. The Distribution of Demersal Fishes Over Heterogenous Seafloor Habitats: An Application of Landscape Ecology to Video Imager Collected in a Central California State Marine Conservation Area. M.S. Thesis, California State University Monterey Bay, 63 pp.
- Knight A, Lindholm J, DeVogelaere A, Watson F. 2014. An Approach to the Collection, Processing, and Analysis of Towed Camera Video Imagery for Marine Resource Management. *Marine Technology Society Journal*, 48(4): 86-95.
- Kramp H. 2012. Distribution and Habitat Associations of Spotted Ratfish (*Hydrolagus colliei*) in the Monterey Bay National Marine Sanctuary. Capstone Project, California State University Monterey Bay, 35pp.
- Leeworthy VR, Jerome D, Schueler K. 2014. Economic Impact of the Commercial Fisheries on Local County Economies from Catch in All California National Marine Sanctuaries 2010, 2011 and 2012. Marine Sanctuaries Conservation Series ONMS-14-03. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 46pp. Available at: <http://montereybay.noaa.gov/research/techreports/trleeworthy2014.html>



Monterey Bay National Marine Sanctuary (MBNMS). 2013. Collaborative Groundfish Essential Fish Habitat Proposal: Protecting Groundfish essential Fish Habitat While Balancing Fishing Opportunities in Monterey Bay National Marine Sanctuary, South of Año Nuevo, 129pp. Available at: <http://montereybay.noaa.gov/resourcepro/ebmi/welcome.html>

NOAA National Centers for Coastal Ocean Science (NCCOS). 2003. A Biogeographic Assessment off North/Central California: To Support the Joint Management Plan Review for Cordell Bank, Gulf of the Farallones, and Monterey Bay National Marine Sanctuaries: Phase I - Marine Fishes, Birds and Mammals. Prepared by NCCOS's Biogeography Team in cooperation with the National Marine Sanctuary Program. Silver Spring, MD, 145 pp.